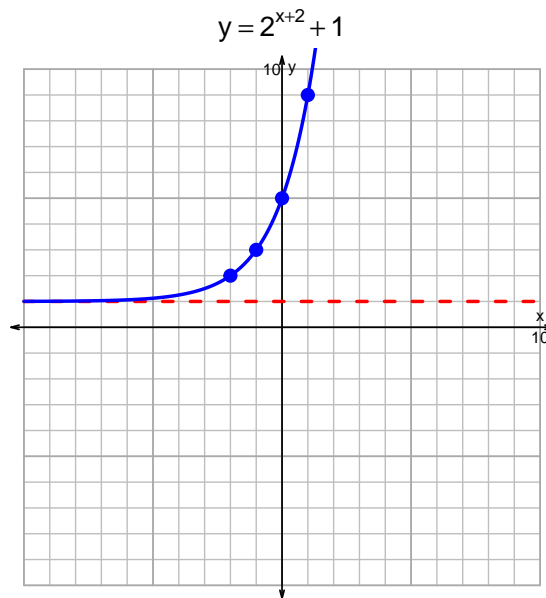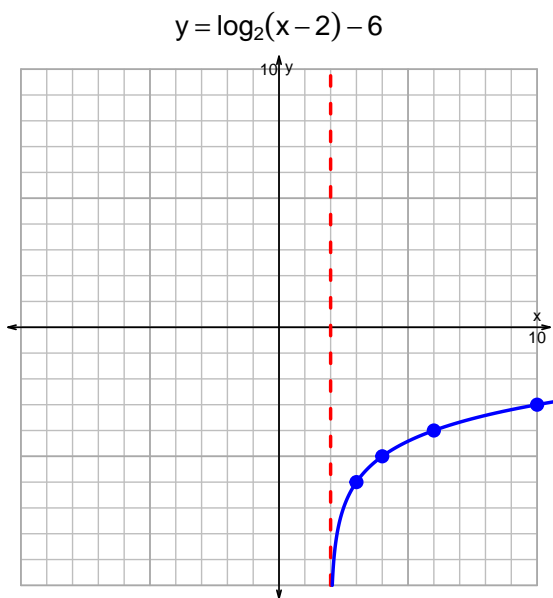## s18: EXP LOG (SLTN v331)

1. (10 pts) Graph $y = \log_2(x - 2) - 6$ and $y = 2^{x+2} + 1$ on the grids below. Also, draw any asymptotes with dashed lines.

$y = \log_2(x-2) - 6$

$y = 2^{x+2} + 1$

Somewhat useful hint: $2^3 = 8$*, and thus* $\log_2(8) = 3$*.*

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$17 = \left(\frac{5}{3}\right) \cdot 10^{-4t/7}$$

Divide both sides by $\frac{5}{3}$.

$$\frac{17 \cdot 3}{5} = 10^{-4t/7}$$

Take log, base 10, of both sides.

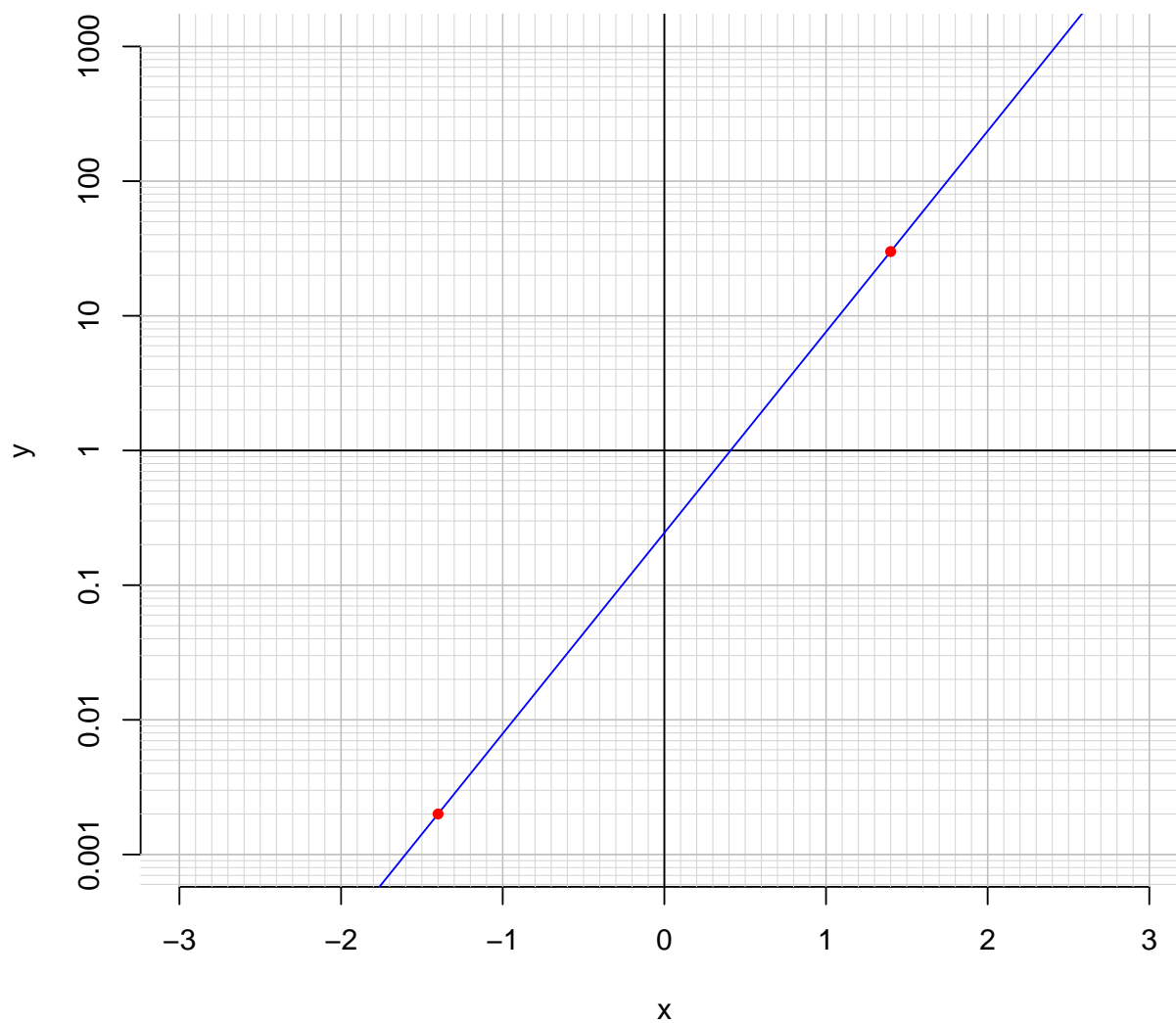$$\log_{10}\left(\frac{17 \cdot 3}{5}\right) = \frac{-4t}{7}$$

Divide both sides by $\frac{-4}{7}$.

$$\frac{-7}{4} \cdot \log_{10}\left(\frac{17 \cdot 3}{5}\right) = t$$

Switch sides.

$$t = \frac{-7}{4} \cdot \log_{10}\left(\frac{17 \cdot 3}{5}\right)$$

3. (10 pts) An exponential function $f(x) = 0.245 \cdot e^{3.43x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(-1.4)$.

$$f(-1.4) = 0.002$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{1}{3.43} \cdot \ln\left(\frac{x}{0.245}\right)$$

Using the plot above, evaluate $f^{-1}(30)$.

$$f^{-1}(30) = 1.4$$